National Aeronautics and Space Administration
Langley Research Center

News Researcher

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Goddard Also Honored in NASA Competition

Langley Takes Top 'Commercial Invention' of Year

BY KEITH HENRY

A team of three Langley inventors have earned NASA's Commercial Invention of the Year Award.

Brian Jensen, Paul Hergenrother and Joseph Smith won for their development of a high-temperature resin material called PETI-5, short for "Phenylethynyl Terminated Imide Oligomers," fifth composition. The three hold a total of three patents on PETI-5.

The novel material can be used both as a glue that holds fibers together in composites and as an adhesive in a variety of aerospace and commercial applications.

PETI-5 was originally developed for high-speed, high-temperature aircraft applications because it is strong and lightweight. Its exceptional combination of properties has attracted the interest of U.S. industry. PETI-5 products are now commercially available and have resulted in about $10 million in sales.

To date, NASA has licensed PETI-5 technology to four companies. Designers and manufacturers like PETI-5 because it is easy to process into complex parts and because of its mechanical properties, durability, non-toxicity and environmental stability. In the future, PETI-5 may be applied to consumer products like high-performance automobile engines.

This is the fourth award PETI-5 has earned for its inventors. In 1997, it was named one of the 100 best inventions of the year by R&D Magazine. In 1998, it won both the Richard T. Whitcomb Aerospace Technology Transfer Award and the NASA Turning Goals into Reality Award for High-Speed Travel.

For their most recent award, Jensen, Hergenrother and Smith will be honored at a NASA Headquarters ceremony next month where they will receive an award check and certificate.

Goddard Has Top Government Inventor

Also honored will be a researcher from Goddard Space Flight Center who took the NASA Government Inventor of the Year Award for a device that helps stabilize spacecraft.

Inventor Charles E. Clagett received the honor for the Apparatus for Providing Torque and for Storing Momentum Energy.

Commonly known as the SMEX Reaction/ Momentum Wheel, the device was developed for NASA's Small Explorer program (SMEX). A compact mechanism was needed that could accelerate at a high rate with little vibration to fulfill the missions' science requirements. The wheel's compact design is durable with at least a four-year life expectancy while providing improved performance and better stability for a spacecraft and significantly reducing vibration.

This reaction wheel invention has been highly successful on the last two Small Explorer missions, the Transition Region and Coronal Explorer and the Submillimeter Wave Astronomy Satellite. The high acceleration rate and low vibration device allows detection of signals that would have been obscured by previous reaction wheels, thus enabling Goddard to support missions that previous technology could not support.

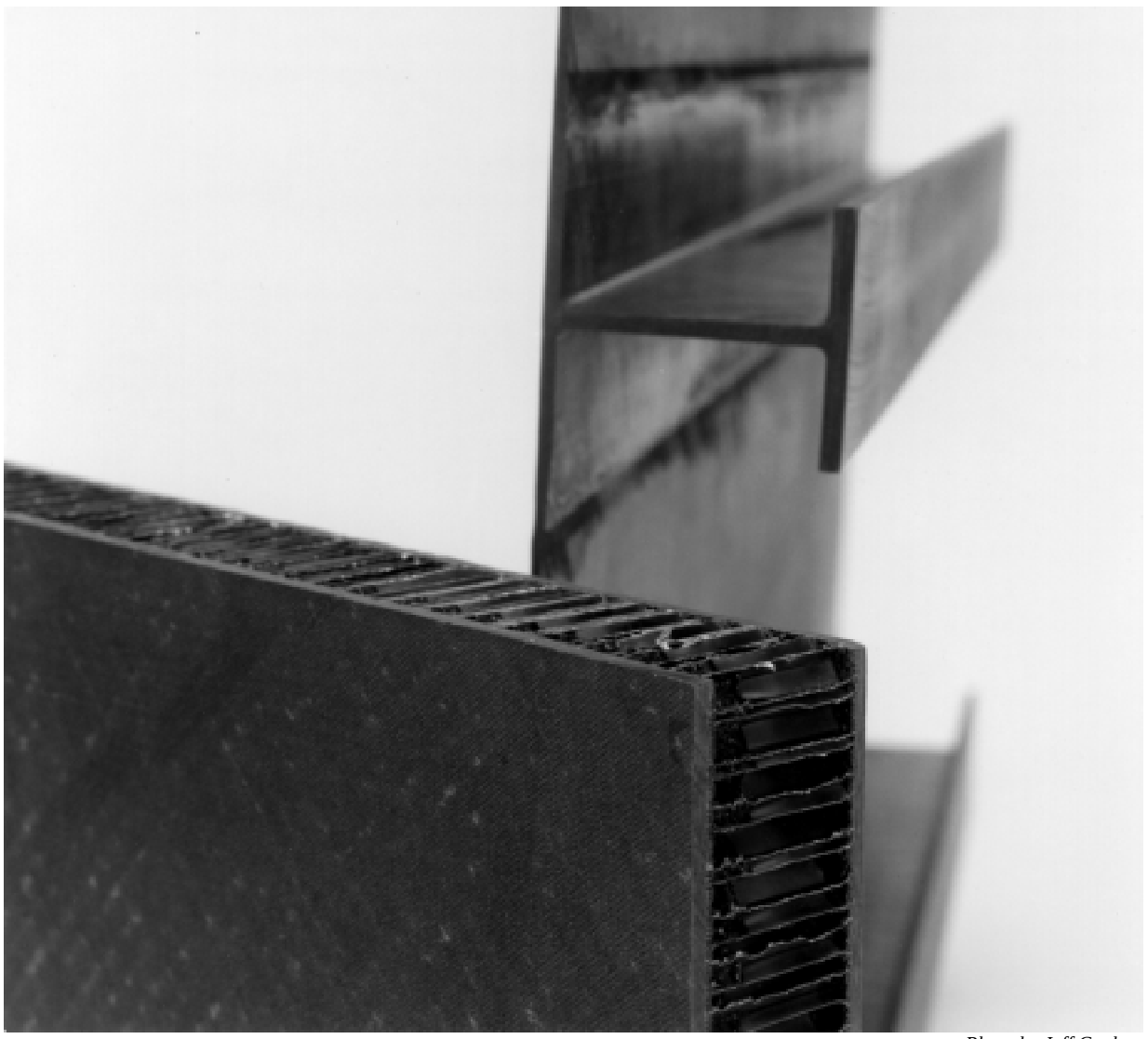

Photo by Jeff Caplan

A high-performance composite material called LaRC™ PETI-5 was developed by NASA Langley. At top is a sample panel made with carbon fibers and PETI-5 fo ruse as a wing or fuselage surface. The bottom piece consists of titanium honeycomb sandwiched between two PETI-5 faces.

Local Students Help NASA Study Sun's Radiation

BY BOB ALLEN

A NASA satellite instrument to be launched later this year has already captured the imagination of a group of Newport News high school students, who visited NASA Langley on March 16.

For the last six months, Menchville High School physics classes monitored natural haze and air pollution by measuring the strength of the sun's rays with photometers that they built.

The students are part of a pilot educational outreach program developed by Langley. It is sponsored by the Stratospheric Aerosol and Gas Experiment III (SAGE III) mission, which will be launched into Earth orbit on a Russian spacecraft in the fall.

The students used common materials to make the photometers. The homemade photometers are simplified versions of SAGE III, which will provide accurate long-term measurements of aerosols, ozone, water vapor, and other trace gases in the atmosphere.

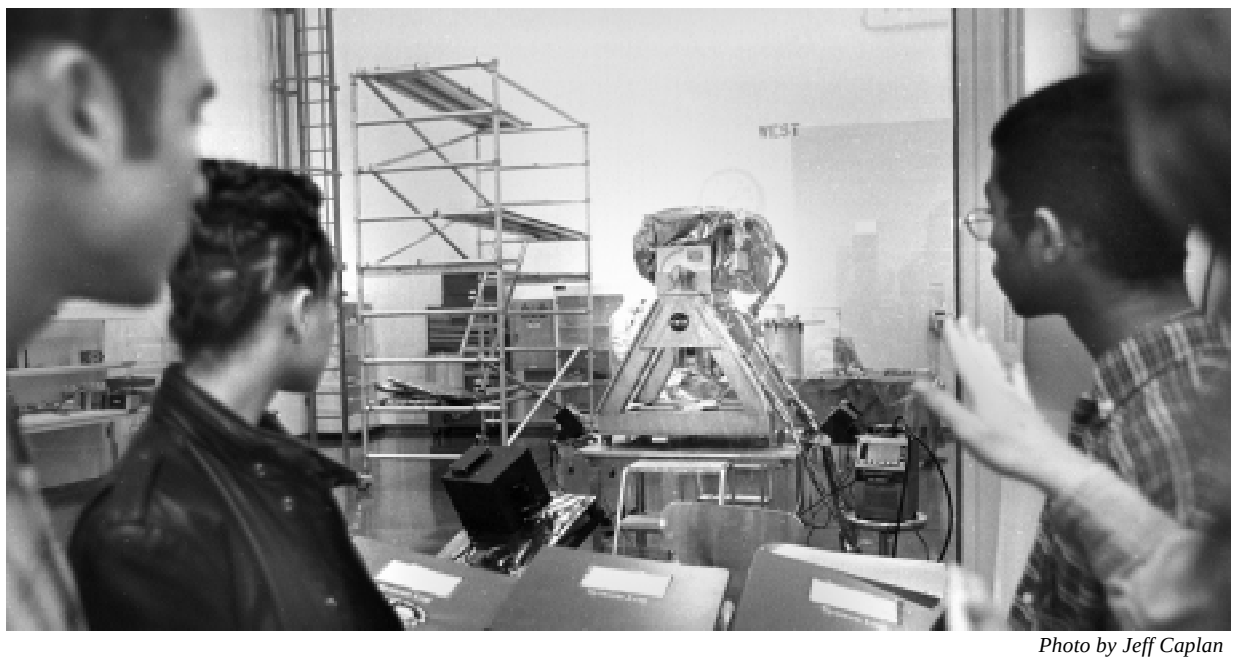

Photo by Jeff Caplan

AP physics student from Menchville High School listen to an explanation of the SAGE III project and how a cleanroom is used Tuesday, March 16. The students were part of a bigger tour of the Atmospheric Branch of Langley that learned about radiation gases that surround us everyday.

News Briefs

Around the Agency

PROPOSALS FOR ADVANCED RADAR: NASA is seeking proposals for a low-cost advanced imaging radar technology that will reduce the cost and enhance the performance of Earth observing satellites. The Lightweight Synthetic Aperture mission, or "LightSAR," is part of NASA's long-term effort in the development and productive use of imaging radars. LightSAR will have the capability to continuously monitor minute changes in the Earth's surface, down to the one-millimeter level. More information is available at the web site: <http://www.earth.nasa.gov/nra/current/>. (Release: 99-40)

ALLIEDSIGNAL WINS CONTRACT: NASA's Johnson Space Center, Houston, Texas, has awarded a contract to AlliedSignal Technical Services Corp., Columbia, Md., for testing, evaluation and maintenance services for the center's White Sands Test Facility in Las Cruces, NM. The potential value of the contract, including award fees based on performance, is estimated at $324 million. (Release: C99-a)

CREW NAMED TO SERVICE HUBBLE: NASA has named two veteran astronauts and a first-time flyer to the crew that will pay an early visit to the Hubble Space Telescope (HST) this October. Four experienced space walkers already have been training for the mission, designated STS-103, a nine-day flight to service and maintain the HST. Commander Curtis L. Brown, Pilot Scott J. Kelly and European Space Agency (ESA) astronaut Jean-Francois Clervoy will join space walkers Steven L. Smith, C. Michael Foale, John M. Grunsfeld and ESA astronaut Claude Nicollier. The astronauts will replace portions of the spacecraft's pointing system, which has begun to fail. (Release: 99-41)

SPACE RESEARCH HELPS DEVELOP FLU DRUG: A NASA-industry team has used the results of space shuttle experiments to develop a new flu drug that may decrease the length and severity of the illness and even prevent the development of symptoms in those exposed to the virus. A "molecular map" of the flu virus from space grown protein crystals was used to design drugs that block the undesirable characteristics of the virus, which infects 20 to 40 million people in the U.S. each year. More information is available at the web site: <http://microgravity.msfc.nasa.gov/>. (Release: 99-39)

FORECASTING SOLAR BLASTS: "S" marks the spot for scientists trying to forecast solar eruptions that can damage satellites, disrupt communications networks and cause power outages. Using the Japanese Yohkoh spacecraft, NASA-sponsored scientists have discovered that an S-shaped structure often appears on the sun in advance of a violent eruption, called a coronal mass ejection, that is as powerful as billions of nuclear explosions. More information is available at the web site: <http://solar.physics.montana.edu/press/>. (Release: 99-35)

Check the Internet for NASA's News and Information web site at: <http://www.nasa.gov/releases/1999/>.

April Colloquium Discusses Planetary Protection Program

A colloquium entitled "Safe Solar System Protection: NASA's Planetary Protection Program," will be given by John D. Rummel April 6 at 2 p.m. in the H.J.E. Reid Conference Center.

Safe Exploration

Life on Earth is extraordinarily tenacious. Such tenacity may provide a lesson about life in general and argues for caution in the exploration of the solar system.

NASA is committed to exploring space while avoiding biological contamination from other solar system bodies, especially any potential harm from materials returned to Earth from space.

Rummel

NASA's planetary protection program has been established to prevent biological cross-contamination during U.S. space missions and establishes the policies and procedures to achieve that objective.

About the Speaker

John D. Rummel is the NASA Planetary Protection Officer, based at NASA Headquarters.

The same lecture will be given at the Virginia Air and Space Center as part of the Sigma Lecture Series Tuesday, April 6 at 7:30 p.m.

Check out the new Colloquium and Sigma Series website: <http://shemesh.larc.nasa.gov/Lectures/>

Retirement Social

A retirement dinner for Clarence (Buddy) C. Poe, Jr., will be held at the H.J.E. Reid Conference Center on Friday, April 9.

Social will start at 6 p.m. with a cash bar. A steamship round dinner will begin at 7 p.m.with the program at 7:45 p.m.

Cost of dinner is $18 per person (includes gift donation). Gift only donations welcome.

Respond by Thursday, April 1 to Jo Sawyer, Mail Stop 188E, ext. 43448, <j.l.sawyer@larc. nasa. gov> or Benson Dexter, ext. 43094, <h.b.dexter@ larc.nasa. gov>.

In Memoriam

Dr. Lenwood G. Clark

Dr. Lenwood Glisson Clark, age 61, died Thursday, March 4.

Clark graduated from Va. Tech, earning a master of science degree in engineering mechanics.

He was chief engineer, Space Projects Office, at Langley with 42 years of service at NASA.

Clark was closely affiliated with the Langley Apprentice School, the Langley Historical and Archaeology Society and the Langley Speakers' Bureau. He also acted as a NASA mentor for students.

Roy F. Brissendon

Roy F. Brissendon, 79, died Saturday, March 13.

Brissendon retired from Langley in 1979 after almost 25 years of service.

Brissendon worked on the Rendezvous Docking Simulator.

He also helped train the Apollo astronauts on that equipment in the early '60s.

Rod L. Waid

Rod Lee Waid, 37, died Sunday, March 14.

Waid served Langley for 13 years as a graphic artist.

Disability Awareness News

Feeling Dizzy?

BY CARLTON RANSOM

Commonly mistaken for a phobia of heights, vertigo is associated with a variety of conditions. Vertigo is a very common symptom extending from damaged or disturbed balance mechanisms in the inner ear or the brain stem.

Balance mechanisms are informants for the brain. Their primary responsibility is to indicate rotary motion in the head. The balance system is stimulated by fluid that moves across tiny hair follicles which are connected to nerves. All information is transported to the brain stem which is responsible for interpretations. Vertigo is a result of mixed messages that are caused by a sudden stop. These mixed messages are sent by the balance mechanisms, visual and other position sensors to the brain stem.

The part of the inner ear that contains the balance system is called the labyrinth. Viral infections can occur within the labyrinth causing severe and sudden vertigo.

Messages to the brain are transmitted by a collection of cells in the brain stem. Brain damage can cause a breakdown in balance interpretation, resulting in vertigo.

There are also many drugs that can cause vertigo; none more common than alcohol. Vertigo resulting from prescription drugs is a direct result from a slight overdose which can be relieved by reducing the dosage.

Vertigo spells should be followed by a trip to a physician as it could be a symptom of a more serious condition.

Theodorsen Award Lecture To Be Given

BY EMILY TODD

Mark V. Morkovin, professor emeritus, Illinois Institute of Technology, will deliver the Theodorsen Lectureship Award lecture April 27 at the Pearl I. Young Theater, Bldg. 1202, following a 10 a.m. reception. His talk is entitled, "Fluid Mechanics, Instabilities, Turbulence and Chaos."

Morkovin

From 1987 to 1992, Langley supported Morkovin's research, in collaboration with NASA scientists, on the transition process in aerodynamics. Morkovin's early interests were in elasticity. He became engrossed in fluid mechanics through his work in World War II. He spent over one-fourth of this career as a research engineer and internal consultant in fluid dynamics for the aerospace industry and the rest of his career in university teaching and research. He has been involved in fluid-mechanical problems across the range of Mach and Reynolds numbers. Two of the products he contributed to substantially are in the Smithsonian Institute – the first transonic and supersonic airplane (X-1) and the first maneuverable re-entry vehicle. His research interests included viscid supersonics, compressibility effects on turbulence, unsteady flows, separated flows, turbulent heat transfer and simulation of wind effects on structures in the atmospheric boundary layer.

This biennial award, sponsored by Langley and the Institute for Computer Applications in Science and Engineering, recognizes those who have made theoretical contributions in the field of aeronautical sciences and engineering.

News Researcher

The *Researcher News* is an official publication of Langley Research Center, National Aeronautics and Space Administration, Hampton, Va., 23681-0001. It is published every other Friday in the interest of all Langley staff, contractors and retirees and has a circulation of approximately 8,100. It is distributed to all Langley civil service employees, contractors, retirees and on-site university personnel, with limited distribution to NASA Headquarters, other NASA centers and, by special request, to other non-NASA individuals and organizations. Questions related to the content and distribution of the *Researcher News* should be addressed to Keith Henry, Mail Stop 115, (757) 864-6120. Submit contributions/SDL 26, 55, 110 changes to the editor via e-mail <m.e.woodcock@larc.nasa.gov>, fax (757) 864-8810, telephone (757) 864-3296 or Mail Stop 145. Articles, photos and announcements are due at noon the Monday following the date of this issue.

Managing Editor. . . . . Keith Henry

Acting Editor. . . . . Meghan Woodcock
Science and Technology Corp.

Photographer . . . . . Jeff Caplan
Science and Technology Corp.

The privilege of listing announcements in this publication is restricted to the employees, contractors and retirees of the Langley Research Center. Articles must be offered without regard to race, color, religion, sex or national origin. All materials are subject to editing.

Donation Check Delivered to Fire Victims

BY KEITH HENRY

A $4,000 check, representing the gifts of hundreds of individual donors from NASA Langley and Langley Air Force Base, has been delivered to the victims of the tragic trailer fire that occurred Jan. 17 at nearby Langley Village Mobile Homes park.

John Greco, chairperson of the NASA Langley Exchange, delivered the check to Donald and Heather Clark at their temporary home in the Buckroe Beach area.

"The family was overwhelmed at the generosity of the NASA Langley community," Greco said. "It was hard for them to hold back the tears. I had a little trouble with that myself. They said they don't know how they would ever repay the people who have helped them. Heather said that you hear a lot about how cold the world is today, but all they have experienced is generosity."

In the fire, the young family's 2-month-old girl, Destiny, lost her life. The trailer and most of their possessions were destroyed, including pictures of Destiny. The couple's 3-year-old daughter and 4-year-old son were not injured.

The family said they would use the money to buy furniture and pay rent through the summer.

Money was donated by employees and contractors from Feb. 19 through March 5 at the NASA Langley cafeteria and at the NASA branch of the Langley Federal Credit Union. At the credit union, people could drop donations in boxes at the cashier stands or make direct deposits to a special fund for the family. Both NASA and Air Force members donated money at the credit union site.

The collection was sponsored and managed by the NASA Langley Exchange, established in the Space Act of 1958 to benefit the health and morale of all NASA Langley employees. It has responsibility for the NASA Cafeterias, the Child Development Center, the Exchange Shop in the main cafeteria, the Exchange business office and oversight for the NASA Langley Activities Association which, in turn, facilitates employee clubs and organizations.

The family told Greco that they had received another $5,000 in miscellaneous contributions since the fire. The day after the fire, the Daily Press reported that the Hampton Roads Chapter of the American Red Cross had provided $1,200 worth of vouchers for groceries, linens and pots and pans.

The Daily Press also reported that Heather Clark stays home with the children and Donnie is a painter.

The fire was reported shortly after 1 a.m. the morning of Jan. 16 by NASA Langley security officers who saw flames coming from the nearby mobile home on a center security monitor. They notified Hampton firefighters stationed at NASA. Firefighters from three stations, including NASA, responded. The blaze was extinguished less than 30 minutes after it was reported.

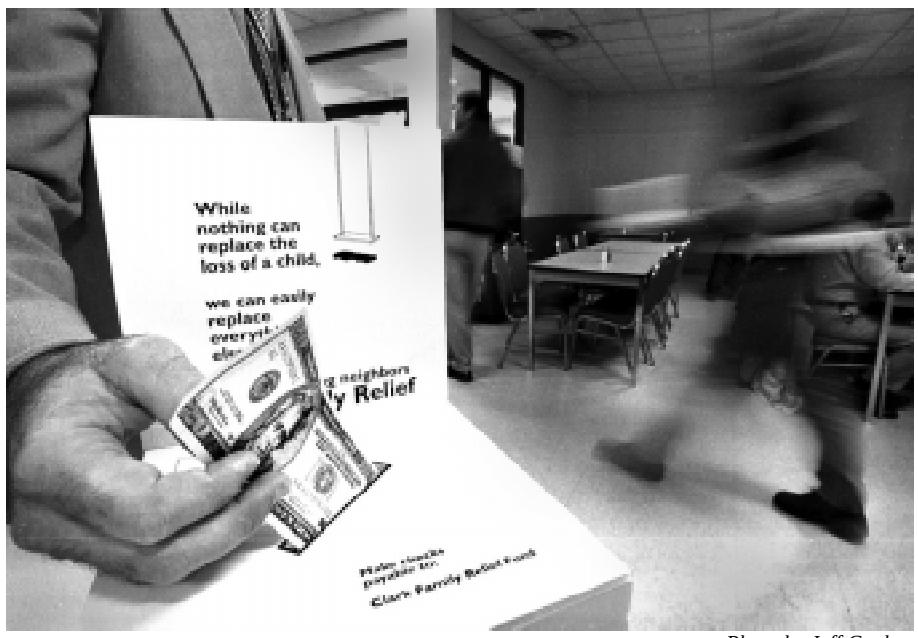

Photo by Jeff Caplan

The Langley community donated $4,000 for the Clark family in a recent two-week period. This box was placed at a cash register in the main cafeteria.

VASC Names 'Top Ten' Volunteers

BY MARNY SKORA

The Virginia Air and Space Center recently honored over 200 volunteers who, in 1998, assisted in stimulating stakeholder interest in aerospace and the sciences.

This dynamic cadre of volunteers contributed over 14,000 hours of service. At the recognition ceremony Executive Director and CEO Kim Maher noted the volunteer service is equivalent to an additional seven full-time staff positions.

The Center awarded volunteers in categories ranging from 100 hours to 2,000 hours donated. Volunteers assist with activities ranging from tours and floor demonstrations to helping teachers in the Educator Resource Center and staff in the Center's administrative offices. Volunteer coordinator Bert Smith praised his "staff" for substantially contributing to the success of the Center and its programs.

The "Top Ten" volunteers were given special recognition.

A student at Eaton Middle School, **Chet Jordan** was named VASC Volunteer of the Year. The eighth grader began his volunteer service in June 1998 as an assistant for the summer day camp program. Jordan quickly expanded his knowledge of the Center's exhibits and floor demonstrations. He has become proficient in providing live science demonstrations, serving as a tour guide and assisting day camp and birthday party groups. He also assists at the admissions desk, the IMAX Theater and the museum store. To top off his accomplishments, Jordan was recently recognized by the VASC for achieving top sales during a special promotion, selling more than $1,500 in memberships to the Center. In just seven months, Jordan has contributed almost 640 volunteer hours.

LaRC retiree **Ken Pierpont** was recognized for over 1,000 hours of volunteer service. The "point man" for the amateur radio exhibit, Pierpont promoted the exhibit concept and solicited support from various Tidewater area radio groups. He serves as a coordinator, equipment trouble-shooter and radio operator.

Reaching the 2,000-hour milestone, Newport News Shipbuilding retiree **J. Wally Carter**, is again in the Center's Top Ten. Carter devoted nearly 700 hours in 1998 toward the smooth and continuous operation of the Center's amateur radio station. He serves as an equipment maintenance and station operator, recruiter and trainer, as well as a mission interpreter for tour groups and the general public.

Also a 2,000-hour volunteer, **Dottie Elwell,** has been a Top Ten volunteer for the past four years. Elwell works in administration and community relations roles, assisting the Center's public relations and marketing staff. She archives press clippings and assists with mailings, surveys, special events and greeting visitors.

A student at Lindsay Middle School in Hampton, **Andre Christian** amassed 683 hours of volunteer service. Christian first assisted with spring day camp programs and expanded his volunteer activities to summer and holiday camps. He also assists with special events and floor demonstrations. He is a role model for the Center's young campers.

Retired Air Force pilot **Tom Brown** has devoted nearly 300 hours to the Educator Resource Center since becoming a volunteer in May 1998. He "works" two mornings a week, adding additional hours – even days – when needed.

A student at Davis Middle School in Hampton, **Tina Krauch** became a youth volunteer in July 1998 and has since volunteered nearly 175 hours. She helps with floor demonstrations, monitors the changing exhibit area and assists with IMAX Theater operations almost every weekend and school holiday.

Retired NASA aerospace engineer **Hugh Clark** maintains a two-day per week schedule at the Center. Clark was a member of the first docent training group in 1992. He donated more than 300 hours as a weekday docent. Since 1997, he has maintained a two-day-per-week schedule as an amateur radio operator. He has now amassed over 800 hours of service to the Center.

A sales professional, **Kenneth Flick** has been a docent since 1996, averaging more than 200 hours of service per year. In addition to providing group tours, he also goes into area schools presenting programs on planets, the space program and astronauts. Flick has donated over 650 hours of volunteer time.

Retired from civil service at Fort Eustis, **Don Evans** pulls a four-hour shift each and every week as a radio station operator. In addition, he helps with station operation during special events. A volunteer for the past two years, Evans has donated nearly 450 hours of volunteer service.

VASC volunteers come from every walk of life and represent every age group. These talented individuals are doing NASA a great service. Langley Research Center is proud to have them as part of our visitor center family.

Six of the VASC "Top Ten" volunteers are, left to right, Tom Brown, Andre Christian, Tina Krauch, Chet Jordan, Kenneth Flick and Don Evans.

AdVentures

FOR SALE: Compaq 14" color monitor, $75. Radio Shack computer dual speaker system, $25. Excellent condition. Call evenings 898-8463.

FOR SALE: Two dark green table lamps with forest green lamp shades, $30/set. Loveseat/chair, tan with burgandy and green print, $50/set. Computer desk with hutch, corner section with printer stand, $35. 14-foot trampoline, one year old, in great shape, $175 firm. Call 826-1862.

FOR SALE: Roadmaster Vitamaster 500/R-9850 treadmill with adjustable speeds, electronics with time, speed and distance, heavy-duty frame, $175. Used twice. Call 877-2841.

FOR SALE: McLean grass edger, excellent condition, $50. Call ext. 43485.

FOR SALE: Nordic-Rider, excellent condition, $50. Call 898-1804.

HOUSE FOR SALE: Beautifully renovated house in Hampton's historic Wythe section, 2 BR, 1 bath, large living room and kitchen, hardwood floors throughout, enclosed front patio, custom privacy fence, large detached garage/workshop, one block from the Chesapeake Bay in neighborhood with lots of trees. 69 Locust Ave, $64,900. Call 247-5144.

HOUSE FOR SALE: 2,200 sq. ft. brick rancher in Poquoson, waterview, 3 BR, 2 baths, living and dining rooms. Eat-in kitchen, front porch, deck, fence. Call 868-8483.

FOR SALE: 1967 Coronadao 25' sailboat, cabin with galley and head, 1998 Nissan eight-horsepower outboard, three sails, fully equipped, new interior cushions/canvas. Excellent condition, $4,500/OBO. Call 253-9414.

LAA NEWS: LAA is sponsoring an **Easter Egg Hunt** Saturday March 27, 1 to 3 p.m. on the Reid Conference Center grounds, rain or shine. Call ext. 46369 with the number of children coming for planning. Put on your dancing shoes for the **"Dance the Night Away"** social at Afterburners, Bldg. 1222, Friday, April 16. Learn how to dance the Cha Cha, Rumba, Foxtrot, Swing, Electric Slide and Macarena. Lessons from 4:30 - 5:30 p.m. Dance all night long to music performed by "A Step Above." Free admission, call ext. 46369 for more information. The **LAA Carnival** is scheduled for Aug. 13 and 14, on the LAA grounds near Bldg. 1222. Design a party hat for the LAA **New Year's Eve 2000** party. Entries must be on legal size white paper. Winner will receive free admission to the party. Send entries to the LAA Manager, Mail Stop 496.

NASA GOLF ASSOCIATION: The NASA Langley Golf Association's 1999 season starts April 2 with a tournament at Kiskiack Golf Course near Williamsburg. Ten tournaments are planned through October. Annual dues are $25. For more information contact Jim Gardner at ext. 46003 or Tom Yager at ext. 41304.

NASA RUNNERS' CLUB: NASA's intercenter spring races are scheduled on the following dates: 10-km races – April 5, 22 and 26; 2-mile races – April 7, 19 and 29. All races start at 5 p.m. on Doolittle Road by the H.J.E. Reid Conference Center parking lot. All Langley employees, retirees, and on/near-site contractors earn points for the Langley team by participating. Runners, joggers and walkers are welcome. For more information contact Richard Shearer at ext. 47036 or visit the Langley Runners' Club web site at <http://larc-exchange.larc.nasa.gov/laa/runners>.

NASA TENNIS CLUB: The NASA Langley Tennis Club will start tournaments, ladder competition, leagues and clinics in April continuing through November. Annual club membership dues are $10. Contact Raul Mejia at ext. 43485 or Tom Yager at ext. 41304 for more information.

NEW IMAX FILM: Sail down the Nile river, soar over the great pyramids and delve into the tombs of ancient pharaohs with the Virginia Air and Space Center's newest IMAX film, "Mysteries of Egypt." This lastest IMAX film was created by National Geographic and stars actor Omar Sharif. Shows daily March 26 through July 15. For more information call 727-0900, ext. 703.

VOLUNTEERS WANTED: The 1999 summer season of the Virginia Air and Space Center's (VASC) driving tours of NASA Langley begins in June on Memorial Day weekend. The first drivers training meeting will be held April 2, 9 a.m. at the VASC. For more information contact Steve Devan at 898-9290.

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Researcher News

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Center Snapshots

Photo by Jeff Caplan

Carey Smith, of the U.S. Army Research Laboratory, is assigned to the Hanger to work on NASA flight vehicles, but mainly the Boeing 757. He is one of a seven-person crew assigned to the airplane. Smith has been at NASA for the past 11 months. He was born in Rome, N.Y. and has a bachelor of science degree in aeronautics from Embry Riddle Aeronautical University. Smith is pursuing a masters degree in education from Old Dominion University. He lives in Newport News with his wife Claudia and two children, Kai, 10 and Sidney, 7.

What do you like most about working here?
"Being assigned to NASA and working on their research aircraft affords me the opportunity of working with a great group of people and having an exciting and ever changing job."
---- Carey Smith